



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/696,267 | 10/29/2003 | Volker Formanski | GP-302183 | 6506 |
| 7590 | 09/07/2006 | | | EXAMINER |
| CARY W. BROOKS General Motors Corporation Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000 | | | KALAFUT, STEPHEN J | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1745 | |
| DATE MAILED: 09/07/2006 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/696,267 | FORMANSKI ET AL. | |
| | Examiner | Art Unit | |
| | Stephen J. Kalafut | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
 - 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) 1-10 and 17-22 is/are allowed.
- 6) Claim(s) 11-16 and 23-27 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 29 October 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>22 Sept 2004</u> . | 6) <input type="checkbox"/> Other: ____ . |

Art Unit: 1745

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. There is no antecedent for "said expander heat exchanger". Instead, there is an "expander heat charger".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11, 12, 16 and 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Wolfe *et al.* (US 5,968,680), cited by applicants.

Wolfe *et al.* disclose a fuel cell stack (14), which includes a plurality of cells, each including an anode and a cathode (column 1, lines 53-58), and which receive and exhaust a fuel gas and an oxidant gas. A compressor (46) provides compressed oxidant, corresponding to the present "charge gas", to the cathodes. The compressor is driven by an expander (26) on the same shaft (54) therewith, which expander receives cathode exhaust gas via a combustor (24). This combustor also receives hydrogen from the anode exhaust (22), and thus heats the cathode exhaust by burning the residual hydrogen. The fuel cell system may be used on a vehicle (column 5, lines 13-16).

Claims 11, 14, 15, 26 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Chludzinski *et al.* (US 4,473,622), cited by applicants.

Chludzinski *et al.* disclose a fuel cell stack (2), which includes a plurality of cells, each including an anode and a cathode, and which receive and exhaust a fuel gas and an oxidant gas. A compressor/expander unit (27), which includes a compressor and an expander on the same shaft, provides compressed oxidant, corresponding to the present "charge gas", to the cathodes. The oxidant exhaust also goes through a gas-liquid separator (34), which removes water. After flowing through the separator, the exhaust oxidant then flows through a heat exchanger (30). This would cool the exhaust gas by transferring heat to incoming oxidant. The fuel cell system may be used on a vehicle (column 2, lines 4-6).

Claims 1-10 and 17-22 are allowed. The fuel cell system with a coolant loop that includes two heat exchangers, one for cooling incoming oxidant, and other for cooling the loop, which is also in contact with the fuel cell, along with a separate recuperative heat exchanger, is not disclosed by the prior art cited herein or by applicants.

Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The fuel cell with a coolant loop that includes a recuperative heat exchanger cooling incoming oxidant and an expander heat exchanger, is also not disclosed by the prior art.

Art Unit: 1745

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wang *et al.* (US 6,896,988) disclose a fuel cell system in which incoming air is heated by cathode exhaust, and again by an oxidizer output. Ballantine *et al.* (US 7,026,065) disclose a coolant loop in contact with a fuel cell and a second coolant loop.

The disclosure is objected to because of the following informalities: Applicants should indicate the final status (either Patent number or abandonment) of the parent application, on the first page of the specification. Appropriate correction is required.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286. The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

sjk


STEPHEN K. LAFUT
PRIMARY EXAMINER
GROUP [700]